



***MAJORSINE® POWER INVERTER***  
**INSTALLATION & OPERATION MANUAL**



**Majorpower Corporation**

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**Revision History**

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**Notes:**

Model Number:

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Serial Number:

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Installation Date:

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**This user's manual contains important technical instructions to be followed by qualified personnel responsible for the installation, start-up and maintenance of this unit. It is recommended that this manual be read attentively to insure safe and reliable operation of this equipment.**

# Warranty

## Majorpower Corporation Warranty Summary for MAJORSINE

A standard 2 year manufacturer warranty is in effect for the products in our MAJORSINE Power Inverter family.

The standard warranty includes depot repair or replacement of any unit that fails during the first two years in operation due to a defect in materials or workmanship. Any unit returned to the factory under warranty will be repaired or replaced at the discretion of Majorpower. Defective units are to be returned freight prepaid against a Return Material Authorization (RMA).

Obtain an RMA number, by calling your service center. The user is responsible for prepaying freight of equipment to the service center. The repaired or replacement unit will returned to the user freight prepaid (limited to North America locations) by the service center if the repair is covered under warranty.

### **Notes and Conditions:**

1. An authorization (RMA) is required to return any product.
2. Out of Box replacements will be shipped for 2<sup>nd</sup> day delivery within North America.
3. An Out of Box Failure must occur and be reported within 30 days of the original shipping date.
4. Additional testing and evaluation charges may apply to equipment tested and found to be in proper operation.
5. All advance replacements will be shipped against the customer's credit card or purchase order. If the defective unit is not received by Majorpower within 30 days then an invoice will be issued for immediate payment.
6. Majorpower reserves the right to supply repaired or equivalent units as replacements.

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## **1. INTRODUCTION**

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### **1-1 General Information**

Thank you for choosing MAJORPOWER as the power products supplier to your company. MAJORSINE Power Inverters are designed and built for full reliability at multiple locations and variety of applications. These intelligent, dependable inverters provide economical AC Power for all your network needs. Operators spanning global continents have deployed the MAJORSINE as the choice for high availability AC power support from a DC source.

This manual contains information and technical details for all models in the MAJORSINE Power Inverter family. The general operation procedures are common, however in some instances, all or part of the information will not apply to the specific model purchased. Refer to the specific model details page in Chapter 8: Technical Specifications.

**This user's manual contains important technical instructions to be followed by qualified personnel responsible for the installation, start-up and maintenance of this unit. We recommend that this manual be read attentively to insure safe and reliable operation of this equipment.**

Should you require any assistance, please call our Application Engineering department at:



**Tel: 888-708-6610 or (919) 563-6610**

**Fax: 888-708-6620 or (919) 563-6620**

**Email: [Tech-Support@majorpower.com](mailto:Tech-Support@majorpower.com)**

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## **2. IMPORTANT SAFETY INSTRUCTIONS**

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### **2-1 Safety Statement**

SAVE THESE INSTRUCTIONS - This manual contains important inverter instructions that should be followed during installation and maintenance of the MAJORSINE inverter unit.

To reduce the risk of electric shock, install the inverter in a temperature and humidity controlled indoor environment, free of conductive contaminants. Ambient temperature should not exceed 50°C (122°F).

- Depending on use, the AC output of the inverter may require a customer installed disconnect or fusing. For telecom use, a GFCI has not been provided. The inverter offers standard AC short circuit protection.
- The following precautions should be respected when working on the inverter:
  - Remove watches, rings, or other metal objects.
  - Use tools with insulated handles.
  - Wear rubber gloves and boots.

### **2-2 Additional Safety Notes**

- Upon receipt, examine the shipment box for damage. Notify the carrier immediately, before opening if damage is evident.
- Do not open or disassemble the inverter, warranty will be voided.
- Do not operate near water or in excessive humidity.
- Keep liquid and foreign objects from entering the inverter.
- Install the inverter in a well-ventilated area. Do not block front air vents, or rear air exhausts of the unit.
- Do not operate the inverter close to combustible gas or open fire.
- Do not plug appliances with surging loads, or half bridge rectified loads, into the inverter.
- Do not operate the inverter if the unit is leaking any liquid or if a white powdery residue is found to be present.
- Temperature: The inverter should be operated in an ambient temperature range of 0°C to +50°C or output efficiency may be affected. Air flow to the inverter must not be impeded.

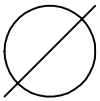


- **Reduced air flow:** Installation of the equipment in a rack should be such that the amount of air flow required for safe operation of the equipment is not compromised.
- **Mechanical loading:** Mounting of the inverter in a rack should be level and balanced.
- **Wiring:** Adequate input power must be supplied to the inverter for proper use; correct wiring sizes must be respected.
- **Grounding:** Reliable grounding of rack-mounted equipment should be maintained.
- **Inverter DC power connection** must be from a VDC source within the technical specifications of the unit under installation.

### **2-3 Symbols**



**PROTECTIVE GROUNDING TERMINAL:** A terminal, which must be connected to earth ground prior to making any other connection to the equipment.



This symbol indicates the word "phase".

## **3. PRODUCT OVERVIEW**

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### **3-1 System Features**

The MAJORSINE series inverter is a highly reliable DC-AC inverter system, designed with advanced power electronics and microprocessor technology offering the following features:

#### **Self-Diagnosis**

The MAJORSINE series inverter is equipped with a self diagnosis microprocessor, able to identify and show all failure messages on the LED/LCD display, with visual/audio alarm.

#### **High Frequency Architecture**

With its high frequency architecture design, the MAJORSINE series inverter features high efficiency, light weight and compact design.

#### **Modular Design**

MAJORSINE inverters use a modular design structure, resulting in easy maintenance, and high MTBF.

#### **High Efficiency**

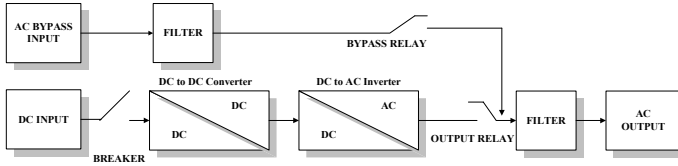
MAJORSINE series inverters offer advanced soft-switching designs which increase operating efficiency and reduce switching noise.

#### **Advanced Protection Features:**

- Input reverse polarity-proof protection
- Internal over temperature protection
- Output overload protection
- Output over/under voltage protection
- Output short circuit protection
- DC input short circuit protection: fuse and breaker
- AC input short circuit protection: breaker
- Input over/under voltage protection
- Fan failure detection and protection

### 3-2 Block Diagram

## MAJORSINE Inverter Block Diagram



MAJORSINE inverters feature IGBT (Insulated Gate Bipolar Transistor) technology, minimizing weight and dimension, while enhancing output short circuit reliability and overload capacity.

Output voltage is provided in one of two ways:

- 1) From AC input bypass mode: (Off-Line Mode)
- 2) From DC to AC inverter mode: (On-Line Mode)

Either mode is front panel programmable; the selected operational mode will predetermine the “default” output.

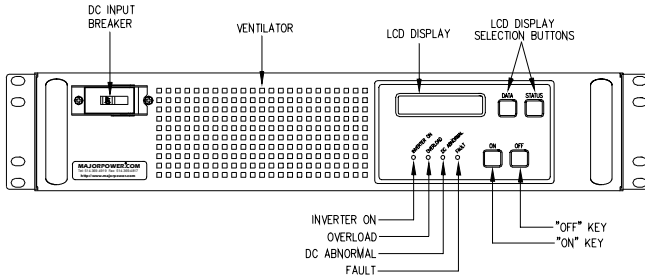
In the first option, **Off-Line mode**, AC output power will be supplied through the AC bypass mode in its “normal” operation. Upon AC input failure, output power will be diverted through the DC to AC inverter mode. Once AC mains are restored, the unit will revert from inverter mode to bypass mode.

In the second option, **On-Line mode**, AC output power will be provided directly by the inverter from the VDC source. Should the DC source or inverter fail, the system will transfer its output power through the bypass mode. Once the DC power source is restored, the system will revert to “inverter” mode.

Transfer time from inverter to bypass, or bypass to inverter is < 4 ms.

The Off-line/On-line mode is changed from one to the other by pressing the ON button for less than 3 seconds when normal output is available. The operational mode cannot be changed during an abnormal or fault condition.

### 3-3 Front Panel



➤ **ON/OFF buttons:**

These are the two power buttons for turning on or turning off the inverter.

Once the inverter is on, the “ON” button works as the On-Line <=> Off-Line mode switching button.

- **INVERTER ON** Indicates the INVERTER has been turned on and is working normally (output is available to support load equipment).
- **OVERLOAD** Means that the inverter is in overload condition, or that there is an output short circuit.
- **DC ABNORMAL** Means that the input DC voltage is “abnormal” and requires verification.
- **FAULT** Indicates that the inverter is in “fault” condition. See Section 6-3 *Alarms*

**\*\*If utility by-pass is not being used, and AC input is not present, the fault LED will remain on.**

➤ **LCD Display Selection Buttons**

The following data: (output voltage, output frequency, load, input dc voltage, bypass ac voltage, bypass ac frequency, etc.) and system status can be shown sequentially on the LCD display by pressing these two buttons.

For more information – Refer to Section 5 Operation

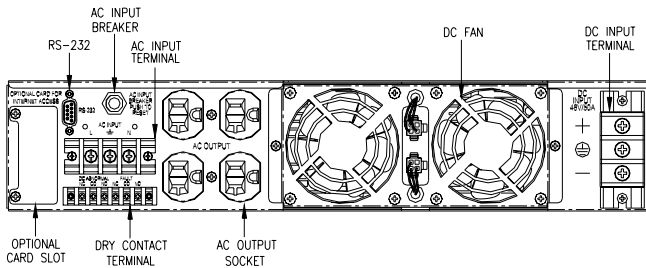
➤ **Ventilator**

The ventilator on the front panel provides inverter cooling. Do NOT obstruct this vent or the fan exhaust in the back of the unit!

➤ **Circuit Breaker (DC Input Breaker)**

The DC circuit breaker will be tripped if there is a “short circuit” condition within the inverter. Reverse polarity protection (input) and overload protection are integrated within the internal circuitry and neither of these faults should trip the DC breaker.

**3-4 Rear Panel**



➤ **Communication Interface**

MAJORSINE Inverter provides two standard and integrated communication interfaces

- a) RS-232 interface.
- b) Dry Contact interface.
- c) The optional SNMP/Web Adapter card is available, please contact your Sales Distributor for information.

➤ **FAN**

Inverter cooling is provided by DC fans. Forced air flow is from front-to-back.

➤ **AC Output Receptacles**

NEMA 5-15R/5-20R × 4 or IEC-320 x 4

➤ **AC Input Terminal**

Terminal for bypass VAC input voltage.

➤ **AC Input Breaker**

Breaker for AC input

➤ **DC Input Terminal**

Terminal for VDC input voltage.

FLOATING input “+” and “-” connection.

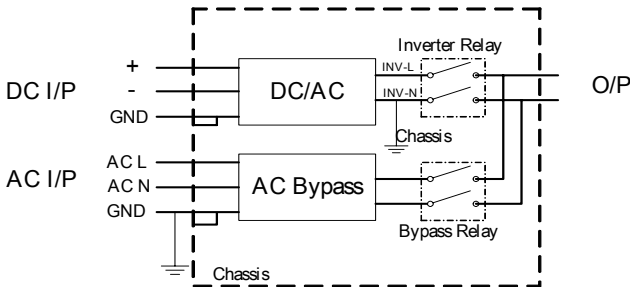
➤ **Dry Contact Terminal**

Dry contact terminal is connected to two Form C relays. One is for “DC abnormal” and the other one is for “FAULT”.

When input DC voltage or fault occurs, the internal contact relay will open/close.

The terminal can support 5A / 250VAC

**3-5 Bypass Switching and Grounding**



**Operation = Off – Line Mode:**

AC input supplied from local service panel,  
AC I/P neutral to earth connection provided externally.  
(Usually service panel)

**Operation = On– Line Mode:**

DC input supplied from battery/DC power system  
Inverter originated AC, therefore neutral to earth  
connection provided internally to chassis.

**Grounding:**

Chassis to Earth Ground connection should be made per customer installation specifications or prevailing safety jurisdiction authority.

The inverter external safety ground plane is not switched by operation in any mode. Typically - the chassis is mounted in a rack or a conductor to ground plane is installed.

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## **4. INSTALLATION**

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### **4-1 Delivery**

Upon receipt of goods, check the condition of the package. Should the package or unit be damaged, refuse receipt and/or contact your shipper immediately to initiate your claim.

### **4-2 Installation Procedures**

- Mount unit using the brackets and screws supplied in the hardware kit.
- Please check that the input DC voltage supply meets the VDC specification of the inverter, and verify the correct DC polarity connections have been made to the inverter.
- Turn off the DC breaker before connecting the DC voltage to the input terminal. The DC terminal strip will accommodate ring terminals with wire sizes recommended in chart below.

<p><b>NOTE:</b> Sparks will occur if the breaker is “on” when connecting the input DC voltage. This is a normal condition due to the charging current draw from the DC voltage charging the internal capacitor of the inverter.</p>
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- Connect the DC input voltage cables to the ‘+’ and ‘-’ screw terminal only, before engaging the front panel DC breaker. The center screw is chassis ground and should only be used if the AC bypass service (green safety wire) is not connected.
- Connect the bypass service supply. The green wire (safety) conductor will ground the chassis. Additional ground conductors should not be needed to avoid creating undesirable ground loops. Reference local standards or the AHL for your installation requirements.

- Use the following recommended cable sizes when connecting power to the inverter.

<u>Model</u>	<u>Capacity</u>	<u>DC Input</u>	<u>AC Input</u>	<u>AC Output</u>
MAJORSINE1000-24-2U	1 KVA	#6 AWG	#14 AWG	NEMA 5-15R
MAJORSINE1000-48-2U	1 KVA	#10 AWG	#14 AWG	NEMA 5-15R
MAJORSINE2000-48-2U	2 KVA	#6 AWG	#12 AWG	NEMA 5-20R
MAJORSINE1000i-48-2U	1 KVA	#10 AWG	#14 AWG	IEC-320
MAJORSINE2000i-48-2U	2 KVA	#6 AWG	#12 AWG	IEC-320
MAJORSINE1000-125-2U	1 KVA	#12 AWG	#14 AWG	NEMA 5-15R
MAJORSINE2000-125-2U	2 KVA	#12 AWG	#12 AWG	NEMA 5-20R

### **4-3 Installation Tool Kit**

Contents of the tool kit include:

- Poly zip bag containing twelve M4 screws and two 6-32 screws,
- Two large mounting brackets (23" or 24" rack mount),
- Two small mounting brackets (19" rack mount),
- One protective cover for AC input,
- One RS232 Cable.

### **4-4 Locking Hardwire Adapter**

- The optional adapter is a reliable locking NEMA 5-15 plug on one end and terminal screws on the other end. The plug-to-terminal conversion is used to secure bare wire load circuit wiring to the output sockets of the inverter. The adapter includes strain relief for the wires being connected to the terminals.

*Documents Also Available:* Application Note # AN-001



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## **5. OPERATION**

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### **5-1 Connecting the Input Power**

- Once the DC power has been connected, engage the DC breaker to operate the inverter.
- Turn ON the AC bypass supply. Typically a circuit breaker in the service panel.
- Verify operation start-up sequence of the inverter and make settings changes as needed for the application. (See 5.3 or 5.3a – Front Panel Operation)

### **5-2 Connecting the Loads**

- Calculate the total power consumption (VA) of the load being attached to the output. Make sure that the total power consumption does not exceed the rated load of the inverter.
- The load consumption can be monitored on the front screen of the inverter using the data button.
- Should the total load exceed the capacity of the inverter, remove uncritical loads until the total load is within the capacity of the inverter. Distribute removed loads to alternate sources or additional inverters
- Only two hardwire adapters will fit on the integrated NEMA duplex outlets of the inverter. Loads should be distributed so not to exceed current ratings of hardware and cable.

### **5-3 Front Panel Operation**

(Firmware Version 0.0 or 3.1)

1. Make sure that the complete installation has been carried out correctly. When the breaker is turned on or the utility input is available, the LCD of the inverter will display either following message:

SYSTEM IS AT  
OFF-LINE MODE

SYSTEM IS AT  
ON-LINE MODE

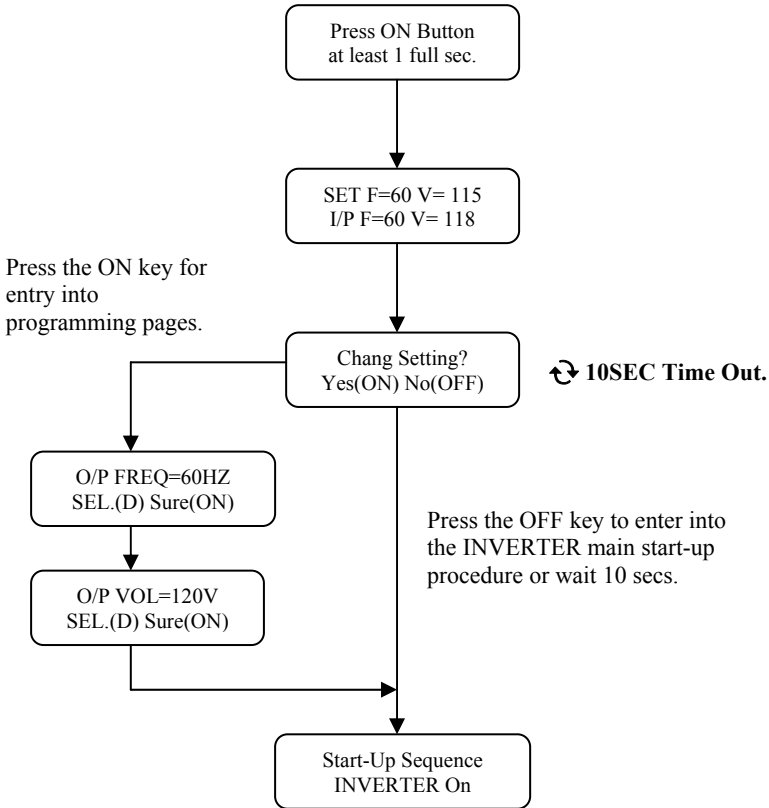
2. Press the “**ON**” button for a minimum of one full second (and Release within **10** seconds) to start the system power. (if you press the ON key less than **1** second, the CPU will not start up correctly). The inverter is in a normal operation condition when either of the following messages appear on the LCD screen:

INVERTER : STD BY  
BYPASS : ON

INVERTER : ON  
BYPASS : STD BY

### 5-3a Front Panel Operation – Settings @ Start-Up

The INVERTER will automatically initiate self-checks and start-up after 10 seconds.



SET = Last Programmed Setting for Operation  
I/P = Bypass Circuit Sensor – If Present.

## 5-4 "DATA" button

You can use the "DATA" button to select the following information which is displayed on the LCD screen:

### A) Output voltage:

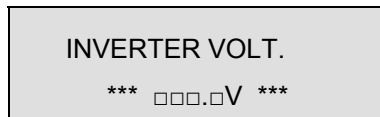
Shows present output voltage.



OUTPUT VOLT.  
\*\*\* □□□.□V \*\*\*

### B) Inverter voltage:

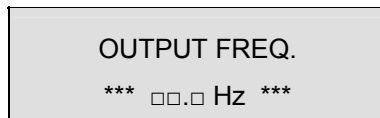
Shows present "inverter" voltage.



INVERTER VOLT.  
\*\*\* □□□.□V \*\*\*

### C) Output frequency:

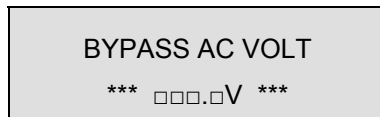
Shows present output frequency.



OUTPUT FREQ.  
\*\*\* □□.□ Hz \*\*\*

### D) Bypass AC voltage:

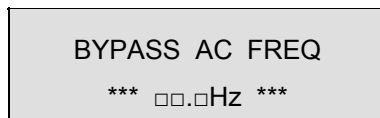
Shows present input bypass AC voltage.



BYPASS AC VOLT  
\*\*\* □□□.□V \*\*\*

### E) Bypass AC frequency:

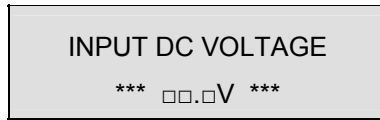
Shows present input bypass AC frequency.



BYPASS AC FREQ  
\*\*\* □□.□Hz \*\*\*

**F) Input DC voltage:**

Shows the input DC voltage.



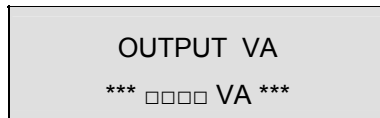
**G) Output current:**

Shows present output current.



**H) Output VA:**

Shows present output Volt-Amp



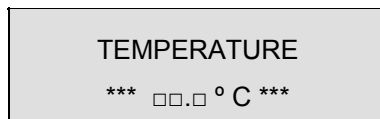
**I) Output power:**

Shows present output power (Watt)



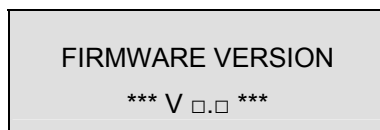
**J) Temperature:**

Shows the temperature inside the INVERTER



**K) Firmware Version:**

Shows the CPU firmware version



## 5-5 "STATUS" button

You can use the "**STATUS**" button to select the following information which is displayed on the LCD screen:

### A) Output status:

- a) When the input bypass voltage is normal and INVERTER output voltage is from DC to AC inverter, LCD shows

```
INVERTER : ON
BYPASS  : STD BY
```

- b) When the output is from input bypass AC, LCD shows

```
INVERTER : STD BY
BYPASS  : ON
```

- c) When the INVERTER is turned off by firmware, LCD shows

```
** OUTPUT **
OUTPUT OFF
```

- d) When the INVERTER is turned off by software, LCD shows

```
** OUTPUT **
SCHEDULE OFF
```

### B) DC to AC inverter status

- a) When the INVERTER is normal, LCD shows

```
** INVERTER **
NORMAL
```

- b)** When the inverter is over temperature (may be caused by overload, high ambient temperature or fan failure), LCD shows.

\*\* INVERTER \*\*  
OVER TEMPERATURE

- c)** When the temperature inside the INVERTER is too high, LCD shows.

\*\* AMBIENT \*\*  
OVER TEMPERATURE

- d)** When the INVERTER output is in “short circuit” detection mode, LCD shows.

\*\* INVERTER \*\*  
SHORT CIRCUIT

- e)** When the INVERTER output is overloaded beyond rated capacity, LCD shows.

\*\* INVERTER \*\*  
OVERLOAD

- f)** When the fan is in “fault”, LCD shows.

\*\* INVERTER \*\*  
FAN FAILURE

- g)** When the INVERTER voltage is “too high”, LCD shows.

\*\* INVERTER \*\*  
OVER VOLTAGE

h) When the INVERTER voltage is “low”, LCD shows.

\*\* INVERTER \*\*  
UNDER VOLTAGE

**C) Bypass AC status**

a) When the input bypass voltage is normal, LCD shows.

\*\* BYPASS AC \*\*  
NORMAL

b) When the input bypass voltage is normal and INVERTER output is in “bypass mode”, LCD shows

INVERTER : STD BY  
BYPASS : ON

c) When the input bypass voltage is “too low”, LCD shows.

\*\* BYPASS AC \*\*  
UNDER VOLTAGE

d) When the input bypass voltage is “too high”, LCD shows.

\*\* BYPASS AC \*\*  
OVER VOLTAGE



- e) When the input bypass is “over” normal frequency range, LCD shows.

\*\* BYPASS AC \*\*  
OUT OF FREQ.

- f) When the output is overloaded, LCD shows.

\*\* BYPASS AC \*\*  
OVER LOAD

#### **D) Input DC status**

- a) When the input DC voltage is normal.

\*\* INPUT DC \*\*  
NORMAL

- b) When the input DC voltage is under threshold, the LCD shows.

\*\* INPUT DC \*\*  
LOW VOLTAGE

- c) When the input DC voltage is over threshold, the LCD shows.

\*\* INPUT DC \*\*  
HIGH VOLTAGE

- d) When the input DC voltage is under voltage, the INVERTER will switch to bypass mode (if bypass AC is available) and LCD shows.

DC UNDER VOLT  
INVERTER OFF

- e) When the input DC voltage is over voltage, INVERTER will switch to bypass mode (if bypass AC is available) and LCD shows.

DC OVER VOLT  
INVERTER OFF

### **5-6 Error message**

If the following messages appear on the LCD screen, contact Majorpower at once.

\*\* INVERTER \*\*  
SOFTSTART FAIL

EEPROM  
NOT AVAILABLE

EEPROM  
checksum error

---

## **6. MAINTENANCE AND TROUBLESHOOTING**

---

### **6-1 Maintenance**

- Make sure that the inverter vents are not blocked.
- Use a vacuum cleaner to clear any dust from the fan area.
- When cleaning the case or front panel, use a soft, dry cloth, only. If the case or front panel is very dirty, use a neutral, non-abrasive detergent. Do **not** use alcohol or ammonia based solutions.
- Regular service, and movement of the inverter, should be performed by a qualified service technician.
- Avoid spilling liquid on the Inverter.

**6-2 Troubleshooting**

<b>Problem</b>	<b>Possible cause</b>	<b>Action to take</b>
LEDs do not light up	The circuit breaker is "off"	Turn on or reset the circuit breaker.
	DC cable polarity installation	Apply correct DC polarity.
	DC input is "over" or "under" voltage.	Apply correct DC voltage.
"FAULT" LED lights up*	Bypass AC fail	AC voltage or frequency may be out of range.
	Inverter failure.	Call for service.
	Output was "short".	Load may be abnormal
"OVERLOAD" LED is ON	The power drawn from the inverter exceeded the load rating of the inverter.	Remove unnecessary loads or redistribute loads to other inverters.
Communication fault.	Incorrect transmission rate.	Use 2400 bps baud rate and re-test.
	Wrong wire connection.	Refer to the wire connection in chapter 7.
"FAULT"LED lights, LCD OVERTEMPERATURE	Temperature inside the inverter is too high.	Check for blocked vents, or non-working fan.

**\*NOTE - If utility by-pass is not being used, and AC input is not present, the fault LED will remain on.**

### **6-3 Alarms**

- Inverter Alarm Classifications
  - Fault Alarm Indicator includes:
    - Bypass AC Input High or Low Voltage
    - Bypass AC Input Frequency Out of Range
    - Fan Fail
    - Inverter Internal Failure
    - Output Load Sensing “short” condition
    - High Temperature
  - Overload Indicator includes:
    - The AC power drawn from the inverter exceeded the load rating of the inverter.
    - See Section 8. *TECHNICAL SPECIFICATIONS*
  - DC Abnormal Indicator includes:
    - Input Low Voltage
    - Input High Voltage

<b>DCV Input</b>	24 V	48 V	125 V
DC Low Voltage Trigger	21	42	101
DC Low Voltage Recovery	22	44	103
DC High Voltage Trigger	29	59	149
DC High Voltage Recovery	28.5	58.5	148.5

**Bypass Utility AC Alarm Thresholds**

**For 100VAC system**

	O/P = 100Vac	O/P = 110Vac	O/P = 115Vac	O/P = 120Vac
AC Bypass Voltage Range	80Vac ~ 120Vac	90Vac ~ 130Vac	95Vac ~ 135Vac	100Vac ~ 140Vac
AC Bypass Frequency Range F=50Hz	45.5Hz ~ 54.5Hz			
AC Bypass Frequency Range F=60Hz	55.5Hz ~ 64.5Hz			
AC Bypass Recovery From Over Voltage	115Vac	125Vac	130Vac	135Vac
AC Bypass Recovery From Under Voltage	85Vac	95Vac	100Vac	105Vac

**For 200VAC system**

	O/P = 208Vac	O/P = 220Vac	O/P = 230Vac	O/P = 240Vac
AC Bypass Voltage Range	188Vac ~ 228Vac	200Vac ~ 240Vac	210Vac ~ 250Vac	220Vac ~ 257Vac
AC Bypass Frequency Range F=50Hz	45.5Hz ~ 54.5Hz			
AC Bypass Frequency Range F=60Hz	55.5Hz ~ 64.5Hz			
AC Bypass Recovery From Over Voltage	223Vac	235Vac	245Vac	255Vac
AC Bypass Recovery From Under Voltage	193Vac	205Vac	215Vac	225Vac

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## **7. COMMUNICATION**

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### **7-1 Dry Contact Communication Terminal**

The “Dry Contact” terminal is the interface for two Form C relays. The relays are used for switching the voltage provided by the user’s external alarm system.

One contact set is for “DC Abnormal” and the other one is for “FAULT”. When alarms in each classification trigger, the relay switches state. (Ref: Sec. 6-3 Alarms) Connection to the terminal should be made to external sensor circuits with appropriate sized wire. The terminal can support 5A / 250VAC in either NC or NO configurations.

- NC: Normally Closed
- CO: Common
- NO: Normally Open

### **7-2 SNMP Expansion Card Slot (WEB)**

Remote monitoring is a prime consideration and requirement to manage multiple network elements from a central location. SNMP remote access as easy as; installing the plug-n-play card, configuring your network IP address, and attaching the network interface cable.

The SNMP Kit includes:

- Interface electronics card
- Cover plate
- RS-232 to RJ-45 custom cable
- Quick installation guide
- CDROM with utilities and MIB

The integrated expansion card slot is located on the rear of the inverter behind a protective cover plate. [Ref: 3-4 Rear Panel] Installation of the SNMP card and cover plate is easily achieved using a standard #2 cross point screw driver. Card IP address programming required PC interface. Instructions for installation are included in the kit.  
(kit sold separately)

**7-3 RS-232 Communication Port (GUI)**

The RS-232 communication port provides the following features using a GUI software package that is available by request from Majorpower Corporation:

- 1) Communicates Fault, DC abnormal, Overload, Inverter Fail etc.
- 2) Monitor and display output voltage, output load, input dc voltage and temperature.
- 3) Coupled with PC software application port, provides scheduled on/off function for inverter.

Inverter monitoring data will be transmitted by local RS-232 cable.

All information is provided in GUI format and intended for local maintenance monitoring.

HARDWARE:

BAUD RATE	2400 bps
DATA LENGTH	8 bits
STOP BIT	1 bit
PARITY	NONE

CABLING:

COMPUTER (female) - INVERTER (male)		
PIN2 (RXD)	-----	PIN2 (TXD)
PIN3 (TXD)	-----	PIN3 (RXD)
PIN4 (PNP)	-----	PIN4 (PNP)
PIN5 (COMMON)	-----	PIN5 (COMMON)
PIN6 (PNP)	-----	PIN6 (PNP)
PIN7 (PNP)	-----	PIN7 (PNP)

---

## **8. TECHNICAL SPECIFICATIONS**

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### **MAJORSINE1000-24-2U**

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#### **DC Input**

Voltage	20-30 VDC
Rated Current	50 Amps
Protection	Fuse and DC Breaker
Efficiency	>85% (full linear load), 24 VDC I/P, 120 VAC O/P

---

#### **AC Output**

Capacity	1KVA / 800W
Voltage	100, 110, 115, 120 VAC
Voltage Regulation	±2%
Frequency	50/60Hz ± 0.2Hz
Wave Form	Pure Sine Wave
THD (linear load)	3% 120 V/100%
THD (SPS load)	5% 120 V/100%
Crest Factor	3:1
Receptacles	(4) NEMA 5-20 R outlets

---

#### **Utility Power (Bypass)**

Voltage (Nominal)	120 VAC
Frequency	50/60± 5 Hz
Protection	AC Circuit Breaker

---

#### **Protection**

Short	For 1 second; Switch to Bypass, then shutdown
Overload	105-125% for 3 minutes; 126-150% for 3 seconds; >150% for 1 second; Switch to bypass
Temperature	55 ± 5°(Inside the case)

---

#### **Safety**

Safety	UL / cUL
EMI / RFI	FCC Class A

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#### **Mechanical**

Dimensions	17.32"W x 11.81"D x 3.46"H (440x300x88mm) 2U Rackmount
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#### **Weight**

8kg / 17.6lbs

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**MAJORSINE1000-48-2U**

<b>DC Input</b>	
Voltage	40-60 VDC
Rated Current	25 Amps
Protection	Fuse and DC Breaker
Efficiency	>85% (full linear load), 48 VDC I/P, 120 VAC O/P
<b>AC Output</b>	
Capacity	1KVA / 800W
Voltage	100, 110, 115, 120 VAC
Voltage Regulation	±2%
Frequency	50/60Hz ± 0.2Hz
Wave Form	Pure Sine Wave
THD (linear load)	3% 120 V/100%
THD (SPS load)	5% 120 V/100%
Crest Factor	3:1
Receptacles	(4) NEMA 5-15 R outlets
<b>Utility Power (Bypass)</b>	
Voltage (Nominal)	120 VAC
Frequency	50/60± 5 Hz
Protection	AC Circuit Breaker
<b>Protection</b>	
Short	For 1 second; Switch to Bypass, then shutdown
Overload	105-125% for 3 minutes 126-150% for 3 seconds; >150% for 1 second; Switch to bypass
Temperature	55 ± 5°(Inside the case)
<b>Safety</b>	
Safety	UL / cUL
EMI / RFI	FCC Class A
<b>Mechanical</b>	
Dimensions	17.32"W x 11.81"D x 3.46"H (440x300x88mm) 2U Rackmount
<b>Weight</b>	
	7kg / 15.4 lbs

**MAJORSINE2000-48-2U**

<b>DC Input</b>	
Voltage	40-60 VDC
Rated Current	50 Amps
Protection	Fuse and DC Breaker
Efficiency	>85% (full linear load), 48 VDC I/P, 120 VAC O/P

<b>AC Output</b>	
Capacity	2KVA / 1600W
Voltage	100, 110, 115, 120 VAC
Voltage Regulation	±2%
Frequency	50/60Hz ± 0.2Hz
Wave Form	Pure Sine Wave
THD (linear load)	3% 120 V/100%
THD (SPS load)	5% 120 V/100%
Crest Factor	3:1
Receptacles	(4) NEMA 5-20 R outlets

<b>Utility Power (Bypass)</b>	
Voltage (Nominal)	120 VAC
Frequency	50/60± 5 Hz
Protection	AC Circuit Breaker

<b>Protection</b>	
Short	For 1 second; Switch to Bypass, then shutdown
Overload	105-125% for 3 minutes 126-150% for 3 seconds >150% for 1 second; Switch to bypass
Temperature	55 ± 5°(Inside the case)

<b>Safety</b>	
Safety	UL / cUL
EMI / RFI	FCC Class A

<b>Mechanical</b>	
Dimensions	17.32"W x 11.81"D x 3.46"H (440x300x88mm) 2U Rackmount

<b>Weight</b>	
	7kg / 15.4 lbs

**MAJORSINE1000-125-2U**

---

<b>DC Input</b>	
Voltage	100-150 VDC
Rated Current	10 Amps
Protection	Fuse and DC Breaker
Efficiency	>85% (full linear load), 125 VDC I/P, 120 VAC O/P

---

<b>AC Output</b>	
Capacity	1KVA / 800W
Voltage	100, 110, 115, 120 VAC
Voltage Regulation	±2%
Frequency	50/60Hz ± 0.2Hz
Wave Form	Pure Sine Wave
THD (linear load)	5% 120 V/100%
THD (SPS load)	3% 120 V/100%
Crest Factor	3:1
Receptacles	(4) NEMA 5-15 R outlets

---

<b>Utility Power (Bypass)</b>	
Voltage (Nominal)	120 VAC
Frequency	50/60± 5 Hz
Protection	AC Circuit Breaker

---

<b>Protection</b>	
Short	For 1 second; Switch to Bypass, then shutdown
Overload	105-125% for 3 minutes 126-150% for 3 seconds; >150% for 1 second; Switch to bypass
Temperature	55±5° (Inside the case)

---

<b>Safety</b>	
Safety	UL / cUL
EMI / RFI	FCC Class A

---

<b>Mechanical</b>	
Dimensions	17.32"W x 11.81"D x 3.46"H (440x300x88mm) 2U Rackmount

---

<b>Weight</b>	
	7kg / 15.4 lbs

---

**MAJORSINE2000-125-2U**

<b>DC Input</b>	
Voltage	100-150 VDC
Rated Current	20 Amps
Protection	Fuse and DC Breaker
Efficiency	>85% (full linear load), 125 VDC I/P, 120 VAC O/P
<b>AC Output</b>	
Capacity	2KVA / 1600W
Voltage	100, 110, 115, 120 VAC
Voltage Regulation	±2%
Frequency	50/60Hz ± 0.2Hz
Wave Form	Pure Sine Wave
THD (linear load)	5% 120 V/100%
THD (SPS load)	3% 120 V/100%
Crest Factor	3:1
Receptacles	(4) NEMA 5-20 R outlets
<b>Utility Power (Bypass)</b>	
Voltage (Nominal)	120 VAC
Frequency	50/60± 5 Hz
Protection	AC Circuit Breaker
<b>Protection</b>	
Short	For 1 second; Switch to Bypass, then shutdown
Overload	105-125% for 3 minutes 126-150% for 3 seconds >150% for 1 second; Switch to bypass
Temperature	55±5°(Inside the case)
<b>Safety</b>	
Safety	UL / cUL
EMI / RFI	FCC Class A
<b>Mechanical</b>	
Dimensions	17.32"W x 11.81"D x 3.46"H (440x300x88mm) 2U Rackmount
<b>Weight</b>	8kg / 17.6 lbs

**MAJORSINE1000i-48-2U**

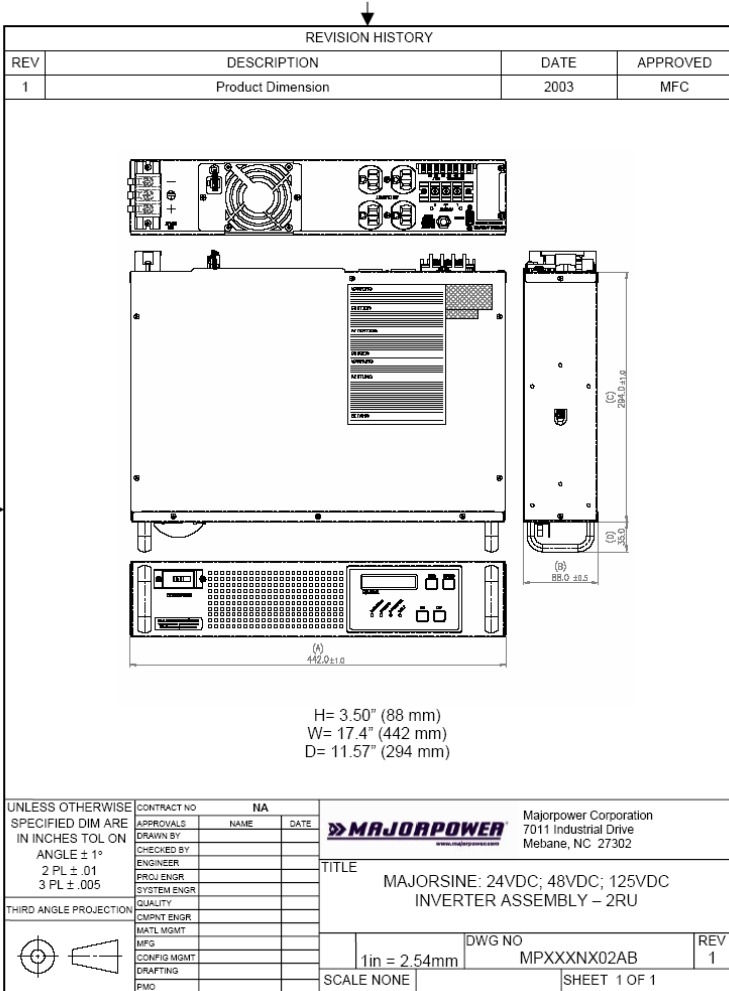
<b>DC Input</b>	
Voltage	40-60 VDC
Rated Current	25 Amps
Protection	Fuse and DC Breaker
Efficiency	>85% (full linear load), 48 VDC I/P, 230 VAC O/P
<b>AC Output</b>	
Capacity	1KVA / 800W
Voltage	208, 220, 230, 240 VAC
Voltage Regulation	±2%
Frequency	50/60Hz ± 0.2Hz
Wave Form	Pure Sine Wave
THD (linear load)	3% 120 V/100%
THD (SPS load)	5% 120 V/100%
Crest Factor	3:1
Receptacles	(4) IEC 320 outlets – C13
<b>Utility Power (Bypass)</b>	
Voltage	Nominal 230 VAC
Frequency	50/60± 5 Hz
Protection	AC Circuit Breaker
<b>Protection</b>	
Short	For 1 second; Switch to Bypass, then shutdown
Overload	105-125% for 3 minutes 126-150% for 3 seconds; >150% for 1 second; Switch to bypass
Temperature	55±5°(Inside the case)
<b>Safety</b>	
Safety	CE Approved
EMI / RFI	FCC Class A
<b>Mechanical</b>	
Dimensions	17.32"W x 11.81"D x 3.46"H (440x300x88mm) 2U Rackmount
<b>Weight</b>	7kg / 15.4 lbs

**MAJORSINE2000i-48-2U**

<b>DC Input</b>	
Voltage	40-60 VDC
Rated Current	50 Amps
Protection	Fuse and DC Breaker
Efficiency	>85% (full linear load), 48 VDC I/P, 230 VAC O/P
<b>AC Output</b>	
Capacity	2KVA / 1600W
Voltage	208, 220, 230, 240 VAC
Voltage Regulation	±2%
Frequency	50/60Hz ± 0.2Hz
Wave Form	Pure Sine Wave
THD (linear load)	3% 120 V/100%
THD (SPS load)	5% 120 V/100%
Crest Factor	3:1
Receptacles	(4) IEC 320 outlets – C13
<b>Utility Power (Bypass)</b>	
Voltage	Nominal 230 VAC
Frequency	50/60± 5 Hz
Protection	AC Circuit Breaker
<b>Protection</b>	
Short	For 1 second; Switch to Bypass, then shutdown
Overload	105-125% for 3 minutes 126-150% for 3 seconds >150% for 1 second; Switch to bypass
Temperature	55±5°(Inside the case)
<b>Safety</b>	
Safety	CE Approved
EMI / RFI	FCC Class A
<b>Mechanical</b>	
Dimensions	17.32"W x 11.81"D x 3.46"H (440x300x88mm) 2U Rackmount
<b>Weight</b>	
	8kg / 17.6 lbs

**MAJORSINE Inverter Manual / M101.4**

**Drawing No. MPXXXNX02ABX**

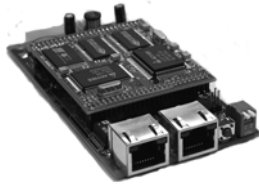


S101 (Rev 2005)

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## **9. Optional Hardware:**

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### SNMP Remote Communication Card:

Remote monitoring is a prime consideration and requirement to manage multiple network elements from a central location.

Remote access is established by simply installing the plug-n-play card, configuring your network IP address, and attaching the network interface cable.



### Locking - Hardwire Adapter:

Reliable locking NEMA 5-15 plug to secure load circuits to the output sockets of the inverter. Heavy-duty design locks the plug in place to prevent disconnecting critical loads.

[Note: Only two hardware adapters will fit on the integrated NEMA duplex outlets of the inverter. Loads should be distributed so not to exceed current ratings of hardware and cable.]